

SEXUAL TRAUMA AND PHYSICAL HEALTH CORRELATES
AMONG WOMEN VETERANS

By

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I would like to dedicate this work to my husband,
Karl Richard Feldthausen,
whose belief in me and unwavering support
has opened the door to endless possibilities.

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This study explored the relationship between experiences of sexual trauma and subsequent physical health problems among women veterans receiving their healthcare at a Veterans Affairs Medical Center. The study was designed to test hypotheses about the impact of sexual trauma on women's perceptions of their own health status, the number and type of current health complaints, and their utilization of healthcare services. This study also examined the possible buffering effects of marital status and mental health interventions on the trauma-health association. Archival records were utilized for this investigation. Women veterans who enrolled in the Women's Clinic at the V.A. Medical Center for primary care between April 1999 and May 2000 (N = 210) had been asked to complete the Women's Health Questionnaire as part of their screening protocol. This questionnaire captured demographic data and self-reported histories of both childhood sexual abuse and adult sexual assault, as well as providing ratings of health perceptions and current physical complaints. These questionnaires were analyzed in connection with

the respondents' medical charts detailing their prescription medicines and the number of visits to primary care, specialty clinics, mental health providers, and the emergency room over a two-year period. Results generally supported the hypotheses about sexual trauma increasing the number of health complaints and resulting in higher utilization of medical services. Women's self-ratings of their health status were not significantly lower for the trauma group in general, but were lower among women who had experienced adult sexual assault. Marital status and mental health interventions were not found to offer any moderating effect on this relationship. Recommendations for future research included the use of prospective design and structured interviews in place of self-report questionnaires. Results are discussed as supporting the bio-psycho-social model of healthcare, and emphasizing the importance of screening for sexual trauma in healthcare settings.

CHAPTER I INTRODUCTION

Over the past two decades, society has become increasingly aware of the magnitude of the problem of sexual trauma. Estimates of the prevalence of child sexual abuse vary, depending upon the definition and setting studied, but range from 5% to 62% of the women involved in the surveys (Fox & Gilbert, 1994; Longstreth & Wolde-Tsadik, 1993). Similarly, lifetime prevalence rates for sexual assault vary by study, ranging from 13% to 20% (Koss, 1993; National Victim Center, 1992). Concomitant with this knowledge has been the realization that the victims suffer repercussions of these acts over many years, both in terms of emotional and physical health problems.

Psychological Effects of Sexual Trauma

A great deal has been learned about the long-term psychological effects of sexual assault and child sexual abuse on the victims. Previous research focusing on mental health diagnoses following sexual trauma has clearly established strong correlations between such a history and posttraumatic stress disorder (Breslau, Davis, Andreski, & Peterson, 1991; Foa & Riggs, 1995; Freedy, Resnick, Kilpatrick, & Dansky, 1994; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris, 1992; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993; Resnick, Yehuda, Pittman, & Foy, 1995; Ullman & Siegel, 1994; Winfield, George, Swartz, & Blazer, 1990). A positive association between sexual trauma and depression has also been shown to exist (Atkeson, Calhoun, Resick, & Ellis, 1982; Becker, Skinner, Abel, & Treacy, 1984; Ellis, Atkeson, & Calhoun, 1981;

Gidycz & Koss, 1991; Santiago, McCall-Perez, Gorcey, & Beigel, 1985). Additionally, survivors of sexual abuse and assault are more likely to experience greater fear (Calhoun, Atkeson, & Resick, 1982; Resick, Veronen, Calhoun & Kilpatrick, 1986; Roth, Wayland, & Woolsey, 1990; Veronen & Kilpatrick, 1980; Wirtz & Harrell, 1987), and impaired social adjustment and interpersonal functioning (Cohen & Roth, 1987; Ellis, Atkeson, & Calhoun, 1981; Resick, Calhoun, Atkeson, & Ellis, 1981) than persons without such experiences.

Physical Effects of Sexual Trauma

More recently, researchers have turned their attention to the association between physical health and a history of sexual trauma. Women who have experienced sexual assault or prior child sexual abuse have been found to report lower ratings of their health status than nonvictims (Clum, Calhoun, & Kimerling, 2000; Golding, 1994; Golding, Cooper, & George, 1997; Koss, Woodruff, & Koss, 1990; Waigandt, Wallace, Phelps, & Miller, 1990). Such victims have also been shown to suffer from a greater number of physical complaints than women without such histories (Cunningham, Pearce, & Pearce, 1988; Domino & Haber, 1987; Drossman, Talley, Leserman, Olden, & Barreiro, 1995; Farley & Keaney, 1997; Frayne et al., 1999; Golding, 1996, 1999a; Walker et al., 1988). Not surprisingly, research has also suggested that these types of victims tend to visit their primary care doctors more frequently, seek emergency medical services more often, and receive a larger number of prescription medicines than nonvictimized women (Farley & Patsalides, 2001; Golding, Stein, Siegel, & Burnam, 1988; Koss, 1994; Sansone, Wiederman, & Sansone, 1998; Walker, Unutzer, Rutter, Gelfand, Sauners, VonKorff, Koss & Katon, 1999).

Explanations offered for the assault/health association include (a) psychosomatic theory, which states that psychological pain is repressed and finds expression through physical symptoms; (b) that the immune and endocrine systems may be compromised by psychological stress, resulting in declining health; and (c) victims of sexual violence may engage in more unhealthy behaviors due to assault-related stress, such as smoking, excessive alcohol or drug use, or insufficient sleep, diet, and exercise (Resnick, Acierno, & Kilpatrick, 1997).

Recently, the question of whether there might be moderating influences on the association between sexual trauma and physical illness has been raised. Early research into the role of social support as a protective factor against the risk of sexual assault was reviewed by Golding (Golding, Wilsnack, & Cooper, 2002), who went on to suggest that future research was needed to ascertain its role in moderating the assault/health relationship. Another review article (Ullman, 1999) looked more specifically at the function of social support in recovery from sexual assault and found mixed evidence. Some studies showed no significant effect while others claimed positive effects of social support in recovery from the mental and physical health consequences of this crime.

Another moderating variable that has been considered is the role of mental health interventions, whether they be in the form of psychotherapy or psychotropic medications. The findings, thus far, are equivocal. While reasoning would suggest that treatments aimed at lessening emotional distress would ultimately improve physical health, there is little empirical support to be found. Investigation into sleep-disordered breathing among survivors of sexual assault revealed that this particular physical sequelae of sexual trauma has been unresponsive to traditional mental health treatments of therapy and/or medications (Krakow et al., 2002). Kimerling and Calhoun (1994) examined the

influence of both social support and mental health service utilization on victims' recovery from sexual assault. They found that the utilization of mental health services did not alter the physical health consequences of sexual assault; however, their research only spanned one year posttrauma. The authors speculated that the benefits of mental health interventions may become more evident over a longer period of time. They did find evidence that social support plays a role in moderating the deleterious health effects of sexual assault. The literature is sparse in this area, and the influences of mental health treatment and social support in lessening the impact of sexual trauma on physical health remain open questions.

Women Veterans and Sexual Trauma

The majority of the aforementioned studies have been conducted on civilian women through large-scale random surveys or via medical contacts within health maintenance organizations and primary care clinics. A segment of the population that has received little scrutiny in this area is women veterans of military service. Some preliminary research has examined women who utilize the Veteran's Administration healthcare system. Once a significant minority, the number of women veterans has grown exponentially over the past decade. The rising number of women in the military has resulted in a burgeoning women veterans' population, measured at over 1.4 million as of the 2000 census.

Several significant differences between these women and the general population have been found. In 1998, Skinner and Furey studied the health-related quality of life of 719 female veterans compared to a control group of nonveteran women and found that veteran women scored lower on every scale of a 36-item health survey than did nonveterans. Additionally, a survey conducted among 828 women veterans at a large

urban VA medical center (Coyle, Wolan, & Van Horn, 1996) found that a high percentage of them reported histories of child sexual abuse (48%) and sexual assault (41%). While the statistic for sexual abuse is at the high end of the range reported in the civilian population (5-62%), the sexual assault statistic is double that found among civilians (13-20%), leading researchers to conclude that abusive experiences are "disturbingly common among women veterans."

Equally disturbing were the results of a large survey conducted as part of the VA Women's Health Project, which was designed to assess the health status of women veterans. Data analyses from this survey (Frayne et al., 1999; Skinner et al., 2000) indicated that 23% of the women participating reported having sustained a sexual assault while in the military (these two studies did not consider any sexual trauma experienced outside of their military service). A history of sexual assault in the military was positively associated with a variety of current physical symptoms/medical conditions and poorer health perceptions in every domain assessed. Thus, women veterans are of particular interest due to their increasing numbers, higher incidence of reported sexual trauma, and lower quality of perceived health.

Significance of Current Research

This study attempted to gain new understanding of the relationship between a history of sexual trauma (both child sexual abuse and sexual assault) and general health perceptions, physical complaints, and health care utilization among women veterans. Through the use of a self-report instrument, enrollees at a VA Medical Center Women's Clinic were classified into one of two groups: those with a history of sexual trauma and those without such a history. Comparisons were made between the two groups on their ratings of health perceptions, physical and emotional symptoms, and utilization of health

care resources. The roles of marital status and utilization of mental health services were examined for possible moderating effects on the assault/health relationships.

A more complete understanding of the association among physical health symptomatology, medical care utilization, and sexual trauma history would be beneficial to both the victims of sexual violence and society-at-large. By alerting healthcare providers to the nature of this association, they may be aided in diagnostic clarification and more appropriate treatment recommendations. This, in turn, would greatly improve health care for the victims and reduce the demand on medical providers for appointments based on vague psychosomatic complaints. Society would benefit from the lower demand for services through a reduction in healthcare costs, especially in the area of emergency services and prescription medicines. An additional economic benefit would be likely in the area of fewer lost work-days in our society's labor force.

Findings from this study may also be useful in advancing scientific knowledge through confirmation of the sexual trauma/physical health association in the veteran population, a growing sector of society with a high incidence of sexual trauma. This study also extends prior understanding of the assault/health relationship by examining the role of marital status (one form of social support) and mental health interventions as possible moderating variables. Marital status has been shown in previous research to be associated with both physical and mental health outcomes, such as self-ratings of health, mobility limitations (Hughes & Waite, 2002), relapse in breast cancer patients (Declerck, DeBrabander, Boone, & Gerits, 2002), mortality (Lund et al., 2002), depression (Hughes & Waite, 2002), and generalized anxiety disorder (Hunt, Issakidis, & Andrews, 2002). It is possible that the protective factor of a committed relationship extends also to reducing the ill-health effects of sexual trauma, perhaps by providing an emotional outlet for

psychological pain that might otherwise be repressed, enhancing functioning of the immune system through reduced stress, or by promoting an increase in positive health behaviors via a partner's interactions.

The increasing number of women veterans utilizing the V.A. Healthcare system would especially benefit from this knowledge. These women face additional obstacles in obtaining appropriate treatment for symptoms associated with being sexually victimized by males, considering that they are seeking treatment in a traditionally male-focused healthcare setting. After having served in a predominantly male military, in which for some the sexual trauma occurred, and being inculcated with repressive dictums about revealing their victimization, women veterans may find it especially difficult to express their emotional distress and resort to somatization in order to acquire the needed attention from healthcare providers. This may be a factor in explaining why women veterans rate themselves lower on questions assessing their general health than do their civilian counterparts.

Increased awareness regarding the possible moderating effects of social support and mental health interventions on the relationship between sexual trauma and physical health could result in more timely psychological interventions designed to ameliorate or eliminate such symptoms, further illuminating the mind/body connection and advancing the field of holistic medicine. These advances in understanding would serve to improve the delivery of healthcare services to the unfortunate segment of our population who have been sexually traumatized and are now living with its long-term effects, as well as reduce costs for unnecessary medical services in an already overburdened healthcare system.

Building on this accumulating body of knowledge, the present study attempts to further explore the association between sexual trauma and physical health to more fully

understand its impact on women veterans, and examine whether the effect is moderated by marital status or the involvement of mental health services. The following chapter consists of a review of the literature pertinent to these issues.

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this chapter is to review the literature on sexual trauma and associated physical health complaints in order to clarify the formulation of the research hypotheses. The experience of sexual trauma appears to be linked with deleterious health effects in excess of those found following other types of traumatic events, although the literature is sparse in providing data for direct comparisons. A recent study examined various types of trauma exposure in relation to physical health among a community-residing sample of 1,500 New Zealanders (Flett, Kazantzis, Long, MacDonald, & Millar, 2002). Researchers examined three trauma categories: crime (sexual assault, physical assault, and robbery), hazard (natural disaster and disaster precautions), and accident (motor vehicle accidents, other accidents, and tragic death), across measures of health symptoms, chronic limitations, and self-rated health. Results indicated that crime victims reported the lowest health status, the greatest level of chronic limitations, and the highest number of physical symptoms compared to the other trauma groups. A few studies have compared health outcomes among groups of people who reported childhood sexual abuse versus childhood physical abuse with mixed results. Most have found that the experience of childhood sexual abuse results in slightly greater subsequent health problems (Drossman et al., 1995; Farley & Patsalides, 2001; Walker et al., 1999) than physical abuse; however, one study found no significant differences between the two groups on measures of physical symptoms, psychological problems and substance abuse (McCauley

et al., 1997). Indirect evidence of the increased health risks following sexual trauma can be found in the literature linking posttraumatic stress disorder (PTSD) with poor physical health (Butterfield, Forneris, Feldman, & Beckham, 2000; Kimerling, Clum, & Wolfe, 2000; Zoellner, Goodwin, & Foa, 2000). Although there are many types of trauma which can result in PTSD, interpersonal traumas of a sexual nature are implicated as one of the highest risk categories for the development of this disorder. Breslau and colleagues (1991) reported that victims of rape suffer a 49% risk of PTSD development, compared to 31.9% for victims of severe beatings, 16.8% for victims of serious accidents, 15.4% for victims of shootings or stabbings, and 3.8% for victims of natural disasters.

This chapter is divided into six sections, with the first three sections detailing specific studies linking sexual trauma to poor health perceptions, increased physical symptomatology, and high utilization of medical services. Section four looks at the particular concerns of women who are veterans of military service and receive their healthcare through the Veterans Administration Healthcare System. Section five reviews the literature available on the possible moderating effects of social support and mental health treatment. The final section summarizes the research hypotheses for this study.

Sexual Trauma and Health Perceptions

It has been shown that, in general, criminal victimization significantly affects perceived health in female patient populations. Koss et al. (1990) conducted a survey of 2,291 women members of a large health maintenance organization, 57% of whom reported personally experiencing crime. Using hierarchical multiple regression, investigators discovered that criminal victimization was an important predictor of lower ratings of general health. Other variables, including stressful life events with known

links to illness and demographic variables, did not contribute significantly to this association.

Waigandt and colleagues (1990) investigated the long-term physical health implications of sexual assault by comparing a group of 51 victims of sexual assault against a control group of 51 age-matched nonvictims on the Cornell Medical Index-Health Questionnaire. Significant differences were found between the two groups on perceived current health status, with the victim group assigning themselves lower ratings, even though no differences were found between the two groups on demographics, family health history, or past illness symptoms.

The relationship between sexual assault history and perceptions of poor health was also examined by Jacqueline M. Golding (1994) in her study of 1,610 randomly selected women living in Los Angeles, California. Of those surveyed, 299 women (18.6%) reported having been sexually assaulted at some point during their lifetime. When asked to rate their health status between "excellent, good, fair, or poor," women with histories of sexual victimization were more likely than nonassaulted women to report perceptions of poor health, along with functional limitations.

In 1997, Golding et al. expanded this inquiry by performing a meta-analysis of seven population surveys to evaluate the association between sexual assault history and health perceptions. Researchers investigated whether characteristics of the assault, such as identity of the perpetrator, number of assaults, or degree of physical threat or force, had any impact on this association. The studies they examined had a pooled N of 10,001 (7,550 women and 2,451 men), and the combined results demonstrated a robust association between sexual assault and poor subjective health (odds ratio = 1.63, 95% confidence interval = 1.36, 1.95). These findings were consistent across gender and

ethnicity. Victims of multiple sexual assaults, or those assaulted by spouses or strangers, were found to rate themselves lowest on perceptions of their own physical health compared to those who had experienced only one assault or who had been victimized by an acquaintance or parent.

Further evidence of the association between sexual trauma and poor subjective health was found in a large study conducted by the National Center for Injury Prevention and Control and the National Center for Disease Control and Prevention. Researchers gathered data from 8,000 women in a random, nationally representative survey (Thompson, Arias, Basile, & Desai, 2002), of which 299 respondents (18.6%) affirmed having been sexually abused prior to age 18. Assessments of current health status were made by asking participants to rate their general health as "excellent, very good, good, fair, or poor." Responses were then classified into one of two categories: either excellent, very good, or good (87%), or fair or poor (13%). Women who reported having been sexually abused as children were more likely than women without such abusive experience to report poor perceptions of their general health (odds ratio = 1.41, 95% confidence interval = 1.11, 1.78).

It is apparent that prior sexual trauma, whether experienced as a child or as an adult, contributes significantly to lower subjective health perceptions among its victims.

Sexual Trauma and Physical Symptoms

In the early 1980s, trauma researchers were noticing the higher-than-average number of medical complaints in adult survivors of child sexual abuse (Browne & Finkelhor, 1986; Gross, 1980). A flurry of studies followed, trying to ascertain whether a greater number of physical symptoms actually presented themselves in these victims and, if so, what types of symptoms were most common.

Cunningham, Pearce, and Pearce (1988) surveyed 60 adult women regarding their medical complaints. Of these women, 27 acknowledged a history of child sexual abuse, accounting for 45% of the sample. Researchers found that subjects with a positive history of trauma had significantly more frequent complaints of a variety of medical problems. More recently, researchers at Johns Hopkins University School of Medicine (McCauley et al., 1997) surveyed 1,931 patients in their primary care internal medicine clinics regarding childhood abuse and health complaints. A total of 424 respondents (22%) acknowledged having suffered either physical or sexual abuse as a child (15.7% reported sexual and physical abuse or sexual abuse only, 6.1% reported physical abuse only). Women who reported abuse as children had more physical symptoms than nonabused patients (mean = 6.2, *sd* = 0.2 versus mean = 4.0, *sd* = 0.9), including back pain, chronic headaches, pelvic pain, abdominal pain, chest pain, fatigue, gastrointestinal distress, and shortness of breath.

Walker, Katon, Harrop-Griffiths, and Holm (1988) attempted to distinguish psychosomatic problems from organic problems by comparing two groups of women, one with complaints of chronic pelvic pain and the other with specific gynecological conditions. All subjects were administered structured interviews, in addition to laparoscopic examination by a gynecologist who was blind to the interview content. No differences were found between the groups on severity or type of pelvic pathology; however, the chronic pelvic pain group reported a significantly higher prevalence of childhood sexual abuse.

Golding (1996) also looked at the issue of sexual trauma and women's gynecological health by analyzing data from 3,419 women in both Los Angeles and North Carolina who responded to questionnaires about sexual assault and completed the

Diagnostic Interview Schedule. Sexual assault was found to be associated with excessive menstrual bleeding, genital burning, painful intercourse, menstrual irregularity, and lack of sexual pleasure. Researchers found that physically violent sexual assaults and those committed by strangers had the strongest correlations to reproductive system problems, while multiple sexual assaults, date and spousal rape, and completed intercourse were most strongly related to sexual problems.

The nature of physical complaints associated with sexual trauma is not solely a gynecological problem. Drossman et al. (1995) attempted to summarize all the pertinent literature by clinicians and researchers involved in the care of patients with complex gastrointestinal illness. Their review led to the following conclusions: (a) a robust association exists between abuse history and gastrointestinal illness, (b) a history of sexual trauma appears more often among women, (c) this history is not usually known by the physician, and (d) it is associated with poorer adjustment to illness and adverse health outcome.

Another study involved female gastroenterology patients who had a reported history of sexual traumatization (Walker, Gelfand, Gelfand, & Koss, 1995). Following an interview, 89 women were classified as having experienced either less severe or no prior sexual trauma ($n=46$) or severe sexual trauma ($n=43$). Comparisons between the two groups revealed that the severely traumatized group had significantly higher medically unexplained physical symptoms, as well as higher rates of psychiatric disorders.

Headache pain has also been investigated for its association with sexual abuse. Domino and Haber first looked at this issue in 1987, using 30 women who presented with chronic headache pain. After assessment with the Minnesota Multiphasic Personality

Inventory (MMPI), 66% of the participants reported significant histories of prior physical or sexual abuse, with an average duration of 8 years. Researchers found that headache pain developed after the trauma in 100% of the cases; however, participants did not relate the onset of pain to their trauma. Abused women were found to have significantly more headaches than nonabused women.

Five general population studies examining the association between headaches and sexual assault history were synthesized by Golding (1999a). Data from a total of 7,502 subjects contacted in five independent samples of randomly selected community residents were derived from face-to-face surveys, including three surveys of adults and two surveys of youth. A robust relationship was shown between sexual assault and headache, regardless of participants' gender or ethnicity (odds ratio = 1.70). Findings also suggested that persons sexually assaulted in childhood consistently had greater odds of headaches than those first assaulted in adulthood.

Another category of physical symptom that has been found to be associated with sexual trauma is chronic pain. Finestone and colleagues at the London Health Sciences Center (2000) compared three groups of women on questions of abuse history, pain, psychological symptomatology, and medical and surgical history. The experimental group consisted of 26 enrollees of group therapy for individuals who had experienced child sexual abuse, while the control group was comprised of 33 psychiatric outpatients and 21 nurses. Their results confirmed that women with histories of sexual abuse were more likely to experience chronic pain lasting over three months (69% of experimental group compared to 43% of control group). The abused women also reported a greater number of painful body areas, more diffuse pain, and more diagnoses of fibromyalgia.

A variety of medical complaints was found to be associated with sexual assault that occurred during military service in a study of women veterans by Frayne et al. in 1999. While the bulk of this study will be discussed in the section dealing with women veterans, the findings related to specific health problems should be noted here. A total of 3,543 female veterans responded to a national survey with 805 (23%) reporting a history of sexual assault while in the military. Information was also requested about a spectrum of physical symptoms and medical complaints. Comparisons between the women who had been assaulted and those who had not were made via age-adjusted odds ratios to lessen the risk of confounding age with medical illness. Researchers found that sexual assault in the military was correlated with pelvic pain, menstrual problems, chronic fatigue, back pain, headache, and gastrointestinal symptoms. In addition, they discovered that certain medical conditions were seen more frequently in the sexually assaulted group including obesity, irritable bowel syndrome, lost pregnancies, endometriosis, asthma/emphysema/bronchitis, and hypertension. The severe symptomatology of this group is also shown by the fact that 26% of the victimized group endorsed greater than 12 of the possible 24 symptoms, compared to only 11% of the nonvictimized group.

Golding (1999b) looked at the relationship between sexual assault history and demand for medical care in order to determine whether or not victimized women actually have worse physical health than nonvictimized women. She analyzed data from two sites of the Epidemiologic Catchment Area study, Los Angeles (N = 3,132) and North Carolina (N = 2,993). Golding's study looked at the association of sexual assault history with requests for medical care for 21 specific symptoms among randomly selected community residents age 18 years and older. Results suggested that victimized women

actually have a higher prevalence of symptoms than nonvictimized women versus the alternative explanation that such persons seek greater care due to a unique pattern of illness behavior.

It is clear from these studies that the experience of sexual trauma is positively correlated with an increase in physical symptoms across a wide range of medical conditions and body systems. Considering this, it should be no surprise that women with such histories make higher demands on their health care providers.

Sexual Trauma and Health Care Utilization

An early study (Golding et al., 1988) involving 2,560 adult community residents, 343 of whom had been sexually assaulted (13.4%), revealed that women with histories of sexual trauma were more likely to seek medical care than nonvictimized women. Researchers found that sexual assault appeared to increase medical use indirectly, through poor mental and physical health.

Koss (1994) surveyed 413 urban, working women regarding their history of crime victimization and compared this data against medical records kept by their work site-based HMO detailing the number of physician's visits and outpatient costs. She found substantial increases in women's use of medical services by those who had suffered criminal victimization for up to three years following the crime.

In addition to higher numbers of visits to physicians, Salmon and Calderbank (1995) found that victims of sexual abuse tend to engage in a greater number of hospital admissions and surgical procedures in adulthood than nonabused persons. Their study was conducted using university undergraduates (N = 275) of which 22% reported experiencing childhood sexual abuse (9% for males and 28% for females).

As referenced earlier, a study by Finestone et al. (2000) compared women with childhood sexual victimization (n=26) against a control group of women without such histories (n=54) in a health sciences center in Canada and found that victimized women had more surgeries, hospitalizations, and visits to physicians.

Farley and Patsalides (2001) compared four groups of women—no abuse, physical abuse alone, physical and sexual abuse, and unclear memories of abuse—in an examination of health care utilization from a randomly selected sample of 86 adult women in a health maintenance organization. Of those, 27 women reported having experienced both physical and sexual abuse, while 25 reported physical abuse only. Their findings were consistent with earlier studies, showing that sexually abused women had the most severe chronic physical symptoms ($F = 6.03, p = .001$), and a higher number of medical visits ($F = 2.66, p = .05$). While victims of physical abuse had higher numbers of both symptoms and medical visits than nonabused women, the numbers were substantially lower than in the sexually abused group.

Another study examining the relationship between health care utilization and sexual trauma looked specifically at childhood sexual abuse. This study examined the costs of health care services for 1225 women enrolled in a large HMO and found that women who reported abuse or neglect in childhood had median health care costs \$97 per year greater than women without such histories. Additionally, women with histories of childhood sexual abuse had median health care costs \$245 greater per year than similarly nonabused women, and these women were nearly twice as likely to visit the emergency department (Walker et al., 1999).

Interestingly, a study by Sansone, Wiederman, and Sansone (1996) did not entirely support the above findings. These researchers looked at the medical records of

116 women consecutively recruited during routine gynecological appointments in association with trauma questionnaires completed by the participants. They found only moderate correlations between a positive sexual trauma history and physician visits ($r=.25$, $p < .01$) and ongoing prescriptions ($r=.27$, $p < .01$), and a negative correlation with specialist referrals ($r=-.02$). One of the explanations for the weaker findings in this study is that their definition of sexual abuse was "any sexual activity against your will," which may have diluted the results. Other studies have employed more stringent definitions of sexual abuse.

With the exception of the study by Sansone and colleagues, all of the research thus far has substantiated the strong link between a history of sexual trauma and subsequent declines in physical health and increased utilization of medical services. There are several possible explanations for this association: (a) victims of sexual trauma may suffer actual injuries or diseases from the sexual violence that lead to chronic infection, dysfunction, or systemic disorders; (b) functioning of the immune system may become impaired due to the subsequent stress of the sexual trauma, leading to increased infectious diseases; (c) assault-related stress or emotional problems may lead the victim to engage in risky health behaviors, such as using alcohol, drugs, and tobacco, or to neglect positive health behaviors, such as proper diet, exercise, and medical check-ups; (d) inappropriate use of medical services may lead to unnecessary treatments, surgeries, and prescription medicines which may then cause victims to need restorative treatment, and (e) victims may interpret their emotional distress as physical symptoms, either due to repression and resultant somatization, or due to the stigma attached to mental health problems.

Special Concerns of Women Veterans

As reported earlier in this study, the population of women veterans has proven to be unique and not merely a representative sample of the general female population in regards to their health perceptions and sexual trauma histories. Skinner and Furey (1998) conducted a survey by mail with 719 women veterans randomly selected from active enrollees in a large VA tertiary care facility near Boston. Their sample ranged in age from 21 to 93 years, with a mean age of 52.6 years. Only about one-fourth (26%) of the respondents were married at the time of the survey, and 227 (32%) had never been married. Nearly two-thirds (65%) of the participants reported their annual income as less than \$20,000. The majority of the women were white (88%), and 65% of them had completed some college education, with 11% having attained a graduate degree. Participants were asked to rate their health-related quality of life on a 36-item health survey that included eight domains: physical functioning, role limitations attributable to physical problems, bodily pain, general health perceptions, energy and vitality, social functioning, role limitations attributable to emotional problems, and mental health. The scores of the veteran women were then compared against a sample of noninstitutionalized, nonveteran women from the Medical Outcomes Study (Tarlov et al., 1989). Veteran women scored lower than their civilian counterparts in every one of the eight domains, with the largest differences on scales measuring role limitations due to physical problems, role limitation due to emotional problems, and bodily pain.

Another difference between veteran women and nonveteran women was highlighted in the study conducted by Coyle, et al. (1996), which examined the prevalence of physical and sexual abuse among women seeking care through the VA Healthcare System. These authors collected data through an anonymous survey mailed

to 874 veterans receiving care during the last six months of 1994 at the Baltimore VA Medical Center. A total of 429 completed surveys were returned. Demographic information reported by those who responded to the survey was compared to data from the original patient database, revealing no significant differences and confirming the representative nature of the sample. The majority of women in this sample were under age 40 years (56.6%), and 49% of them had taken some college courses but not completed a degree, while 13.5% had earned graduate degrees. At the time of the survey, only 18.4% were married, while 29.8 reported they had never married. For the purposes of this study, rape was defined by the question "Have you ever been forced into unwanted sexual intercourse?" Sexual abuse was defined by asking "Has anyone ever pressured you into doing something sexual, . . . could include . . . touching your private parts, . . . breasts, getting you to touch their private parts, or kissing you in a way that made you feel threatened or uncomfortable?" They were also asked when the abuse occurred.

Results of this survey revealed that 178 women veterans (41.5%) reported having been raped at some point in their lifetime, while another 8 women (1.9%) indicated that they "did not know" if this had occurred. Regarding sexual abuse, 238 (55.4%) responded affirmatively, with 5 women (1.2%) saying it was unknown. Of these 238 victims, 22.3% reported that it occurred when they were children, and another 26.5% said they were sexually abused both as children and adults. Clearly, the prevalence of rape within this population is much higher than that found in similar surveys of civilian populations, which report rape prevalence ranging from 13-20%. The 48.8% who reported they were sexually abused as children is within the range found in civilian population studies (5-62%), but much closer to the higher end.

The authors concluded that a large proportion of these women veterans had been victimized and "may be psychologically and physically affected by their experiences," necessitating better screening, assessment, and treatment by healthcare providers.

Sexual assault sustained during military service (SAIM) is a specific type of sexual trauma that is particular to the population of women veterans. Figures range from 5% to 13% for the prevalence of this type of assault, depending upon the sample and definitions used (Freeman, Ryan, & Hendrickson, 1996; Martindale, 1988; Murdock & Nichol, 1995; Wolfe, Brown, & Kelly, 1993). Sexual assault that occurs during military service may differ from other sexual assaults due to the unique dynamics of the situation. Women in the military are usually young adults, and are both living and working with predominantly male peers. Military training encourages "team-building," which may serve to discourage reporting or follow-up on reports of sexual violence when it occurs within the group.

The Veteran's Administration conducted the Women's Health Project, a national study comprised of a representative sample of women veterans receiving ambulatory care from a VA facility. Data from this study was used to evaluate the prevalence of SAIM (Skinner et al., 2000). Out of 6,216 mailed questionnaires, a total of 3,632 (58.4%) were returned completed. Sexual assault was measured by response to the question, "Did you ever have an experience where someone used force or the threat of force to have sexual relations with you against your will while you were in the military?" In response to this question, 805 women (23%) indicated that they had been sexually assaulted while serving in the military. Comparisons between those who had been sexually assaulted and those who had not revealed that the victimized group averaged 6 years younger in age,

and were slightly more educated than their counterparts. There were no significant racial differences or differences in marital status between the two groups.

Associated researchers (Frayne et al., 1999) looked at this same data set in order to determine the medical profiles of women veterans who had suffered a sexual assault while in the military. Results of their analysis were discussed above regarding the prevalence of specific physical complaints and medical conditions. Researchers additionally found that the women who had experienced SAIM made more visits to their healthcare providers in the three months prior to the survey than did nonvictimized women veterans. The mean number of visits to a mental health specialist was .94 among women with no history of SAIM and 2.62 ($p = .0001$) for women who reported SAIM. The mean number of visits to other healthcare providers (including physician's assistants, nurse practitioners, nurses, social workers, physical therapists, or chiropractors) was 1.5 for nonvictimized women and 2.3 ($p = .0001$) for those reporting SAIM.

These studies underline the uniqueness of the population of women veterans. These women have been shown to report lower ratings of perceived health status and more physical complaints than their civilian counterparts. They also appear to be at greater risk for having experienced sexual trauma, both as children and adults. Their unique circumstance of both living and working in a male-dominated culture places them particularly at risk for sexual assault while in the military. Since the number of women veterans is rapidly rising as more and more young women elect to serve in the military, it is imperative that healthcare service providers understand the specific needs of this population more clearly.

Moderating Variables

The term "moderator" is used in this study in conformance with the definition explicated by Baron and Kenny (1986). These researchers explained that a moderating variable affects the relationship between two variables by interacting with a predictor variable, which then causes an increase or decrease in the dependent variable. They distinguish this action from that of a mediating variable, which specifies the mechanism by which a given effect occurs. Both mental health treatment and marital status are considered to be possible moderating variables, as they may influence the degree of impact sexual trauma has on subsequent health status measures, but neither is thought to be the mechanism by which trauma affects physical health.

While it is clear that women who have been sexually victimized may experience effects of the trauma through worsening physical health over many years, it is not so clear how this effect may be moderated. Considering the psychosomatic theory, it would stand to reason that lessening the emotional distress of these victims would ultimately improve their physical well-being. The psychosomatic theory simply states that repressed emotional conflicts are expressed through bodily symptoms. If true, then strategies aimed at addressing and resolving some of the psychological symptoms that typically follow sexual trauma may positively influence physical health.

Kimerling and Calhoun (1994) attempted to answer this question in their study of 115 women seen at a rape crisis center following sexual assault. They followed this group for one year posttrauma, with four follow-up interviews covering areas such as particular details of their assault, lifetime history of abuse, social support, medical services utilization, mental health treatment utilization, somatic symptoms, and psychological disorders. Data gathered from these interviews was compared against a

control group matched for demographic characteristics. While these researchers found that the sexual assault victims had a higher utilization of medical services over one year than the nonvictims, there was no evidence that the utilization of mental health services had any effect in moderating this relationship. These researchers cautioned, however, that there may have been insignificant findings due to the insensitivity of the measurement of such services with respect to differentiating between long-term therapy, a single visit, or call to a rape crisis center. Also, the participants in the two groups of this study showed no differences in their use of psychological services, even though the victim group had significantly more psychological symptoms, suggesting that these victims did not utilize mental health services for their distress. One possible explanation for this finding is that there is still a stigma attached to mental health treatment which may encourage victims to identify their emotional distress as physical ailments.

Another route to examining this question was taken by researchers looking at one particular physical complaint found in a large proportion of sexual assault survivors, that of sleep-disordered breathing (SLB) (Krakow et al., 2002). Subjects with sleep-disordered breathing report significantly worse nightmares, sleep quality, anxiety, depression, PTSD, and impaired quality of life than those without this disorder. When researchers studied 187 sexual assault survivors, fully 168 of them were diagnosed with SLB. These subjects reported having suffered an average of 20 years from sleep problems, which had been unresponsive to traditional treatments such as psychotherapy and psychotropic medications.

Other research has looked into the role of social support as a possible moderator of the sexual trauma/health association. One of the theories posed for this association

suggests that the stress of sexual trauma compromises functioning of the immune system. Findings from the field of psychoneuroimmunology suggest that psychological stress has a negative effect on physical health through changes in the immune and endocrine systems (Kiecolt-Glaser & Glaser, 1992, 1995; Yehuda, Giller, Southwick, Lowy, & Mason, 1991). Related research has shown that social support can have a positive effect on these same biological systems (Kiecolt-Glaser, Fisher, Ogrocki, & Stout, 1987; Uchino, Cacioppo, & Kiecolt-Glaser, 1996; Uchino, Uno, & Holt-Lunstad, 1999). Logic would suggest that social support may moderate the effects of sexual trauma on physical health by reducing the stress-related changes in the immune and endocrine systems.

The study referenced earlier by Kimerling and Calhoun (1994) investigated the role of social support in moderating somatic symptoms in victims of sexual assault. Their comparison of 115 sexual assault victims to a matched control group found that social support provides a moderating effect on the victim/health relationship ($F = 2.48$, $p < .04$), with higher levels of social support associated with better health following sexual assault. This effect also held true for the association between social support and subjective health perceptions ($F = 2.88$, $p < .02$), with higher ratings of social supports being associated with better ratings of health following victimization. Interestingly, however, no significant interaction was found between ratings of social support and medical care utilization. These researchers reported that a possible explanation for this finding was that medical care utilization did not begin to increase until 4 months posttrauma (this study measured effects at 2 weeks, 1 month, 4 months, and 1 year) and social support may have shown effects if the subjects had been followed for a longer period of time.

Early research into the role of social support as a protective factor against the risk of sexual assault was reviewed by Golding (Golding et al., 2002). However, none of these studies examined the moderating effects of social support posttrauma. Golding suggested that future research was needed to ascertain the role of social support in moderating the assault/health relationship. Another review article (Ullman, 1999) looked more specifically at the function of social support in recovery from sexual assault. Ullman found evidence that social support was related to better self-rated recovery from sexual assault, reduced psychological symptoms, and reduced fear of crime. However, two studies in this review reported no significant effect of social support in recovery from the mental and physical health consequences of sexual assault.

Marital status, as a form of social support, has not been independently evaluated for its role in moderating the link between sexual trauma and declining health. Previous research in other fields of inquiry has shown marital status to be associated with both physical and mental health outcomes. Hughes & Waite (2002) found that married couples reported better self-rated health, less mobility limitations, and lower rates of depression than single people in their survey of 8,485 adults aged 51 to 61 years. A study examining the relationship of marital status and locus of control (LOC) with relapse in breast cancer patients (Declerck et al., 2002) determined that married patients with an intermediate LOC (not polarized to either internal or external) had less pathology and lower levels of stress than their unmarried counterparts. An examination of the relationship between marital status and mortality (Lund et al., 2002) found that subjects living alone had significantly increased mortality compared to subjects who were married or cohabitating. Finally, research into generalized anxiety disorder (GAD) (Hunt, Issakidis, & Andrews, 2002) found a significant association with marital status, with

those subjects who were separated, divorced, or widowed evidencing higher incidence of GAD than married subjects. These findings suggest that there may be some health benefits to marriage that may provide a protective buffer against the ill effects of sexual trauma.

It should be noted that these two variables are being investigated for their role as "moderators" and not "mediators," as distinguished by Baron and Kenny. As pointed out by these authors, the two terms are sometimes erroneously used interchangeably. In actuality, a moderating variable is one that "affects the direction and/or strength of the relation" between the predictor and criterion variables, whereas a mediating variable "accounts for the relation between the predictor and the criterion" (Baron & Kenny, 1986). In the present study, marital status and mental health interventions are predicted to lessen the deleterious health effects that follow traumatic sexual experiences, and they are not considered to be the mechanism by which the trauma-health relationship occurs; therefore, they must be considered moderating variables.

Summary and Hypotheses

The research cited above establishes an association between women's health and sexual trauma, and emphasizes the long-term costs, both in emotional distress and physical impairment, paid by those victims. Society, too, pays these costs in increased medical care and loss of work-days. Women who have served in the U.S. military appear to be especially vulnerable to this risk. With the growth of women's participation in the active military and subsequent increasing numbers of women veterans, it becomes important to understand how sexual trauma, both that experienced prior to their service and during it, impacts the health perceptions and utilization of medical services of these veterans. It is important for health care providers to be trained in recognizing and

treating problems associated with sexual victimization in order to provide the victims with accurate diagnoses and appropriate treatments. As current understanding shifts away from dualistic mind/body notions and begins to recognize the impact of emotional distress on somatic conditions, more comprehensive and integrative services can be offered to alleviate suffering. Understanding the role of social support and mental health treatment as possible moderators in the assault/health relationship would greatly enhance delivery of services to trauma victims.

Hypothesis 1: Sexual trauma and health perceptions. Women veterans have been shown to report lower ratings of their health status compared to their civilian counterparts. Women veterans also have been shown to have a disproportionately high number of sexual victimization experiences during their lifetimes, and are uniquely vulnerable to the experience of sexual assault during military service. Building on the knowledge gleaned from studies involving civilian populations of women, which demonstrate a strong relationship between sexual trauma and low subjective ratings of health, it is hypothesized that women veterans who have been sexually victimized will have significantly lower general health perceptions than nonvictimized women veterans.

Hypothesis 2: Sexual trauma and physical symptoms. Women who have experienced sexual trauma report more chronic physical complaints than their nonvictimized counterparts, and women veterans who were sexually assaulted in the military displayed significantly more physical symptoms than veterans without such a history. Women veterans who have a history of sexual abuse or sexual assault are predicted to have a greater number of physical complaints, ranging across body systems, than women veterans without sexual trauma in their backgrounds.

Hypothesis 3. Sexual trauma and healthcare utilization. Women with a history of sexual trauma use medical services at a higher rate than similar women without such histories. Women veterans who had suffered a sexual assault while in the military were also shown to visit healthcare providers more frequently than nonassaulted veteran women. It is predicted that women veterans who have experienced a sexual trauma during their lifetime will demonstrate higher utilization of healthcare services as measured by visits to their primary care provider, specialty clinics, emergency room and urgent care clinic, and by their number of prescription medicines.

Hypothesis 4. Moderating effects of marital status on assault/health association.

Equivocal evidence exists suggesting that social support may moderate the deleterious effects of sexual assault on physical health. One of the types of social support that has been recognized as having a positive effect on health is marital status. It is hypothesized that women veterans who have been sexually traumatized, and are married or in a committed relationship at the time of the survey, will report higher ratings of their health, have fewer physical complaints, and demonstrate lower usage of healthcare services, due to the moderating effects of this type of support on their stress, when compared to similarly traumatized women veterans without such partners.

Hypothesis 5. Moderating effects of mental health treatment on assault/health association. The few studies available provide mixed evidence for the efficacy of mental health treatment in moderating the negative health effects of sexual trauma.

Psychosomatic theory posits that physical illness results from repressed emotional distress and, if this is true, mental health interventions should serve to alleviate some of this distress. As an exploratory study, it is hypothesized that women veterans with sexual trauma histories, who have engaged in some form of mental health treatment, will

demonstrate less of the assault/health association than nontreated, sexually-victimized women veterans, through higher health ratings, fewer physical complaints, and lower usage of healthcare services.

CHAPTER 3 METHODOLOGY

The purpose of this study was to examine the relationship between sexual trauma and physical health in a population of women veterans receiving outpatient care at a large, tertiary-care VA Medical Center located in the southeastern United States. Two sources of archived data were accessed for this study:) the Women's Health Questionnaire that was completed by new enrollees in a primary care women's clinic, and (b) medical records for these same patients detailing numbers of visits to healthcare professionals over a 2-year period of time. Self-reported histories of sexual assault and/or childhood sexual abuse were studied in relation to ratings of perceived health status, number and type of physical complaints, and utilization of healthcare services. In addition, marital status and the utilization of mental health services were examined for possible moderating effects on the assault/health association.

Participants

In April, 1999, the Women's Clinic for primary care health services was first opened at the VA Medical Center utilized in this study. Between April 1999 and May 2000, as women enrolled in the clinic, they were asked to complete a screening questionnaire covering different aspects of their health complaints and history of interpersonal violence. Of the 247 initial clinic enrollees, seven declined to respond to questions regarding sexual trauma experiences, and 30 were not veterans of military service, leaving a subject pool of 210 participants. Respondents were asked to report

their age, ethnicity, marital status, and education level. The mean age of this group was 51.9 years (SD = 15.9 years). The majority of participants were Caucasian (80.9%) with other participants reported as African-American (10.6%), Native American (3.5%), Asian-American (.5%), Hispanic (3.5%), and other (1%). There were 97 participants (46.4%) who reported themselves as married or in a committed relationship. Of the others, 41 had never married (19.6%), 26 were widowed (12.4%), and 45 were divorced or separated (21.6%). Most of the participants (99%) had completed high school and 43.3% reported having 1 to 3 years of college education. Only 17.6% completed college and another 8.6% graduated from a trade or technical school. Only two participants reported that they had not completed high school (1%), and one of these had less than an 8th grade education.

Procedure

Over the course of 1 year between April 1999 and May 2000, as female veterans enrolled for primary care services through the Women's Clinic, they were asked to complete a short survey entitled the Women's Health Questionnaire, which asked basic demographic and health-related questions, in addition to a Trauma Questionnaire. The purpose for this survey questionnaire was to screen for various physical and mental health disorders, as well as trauma experiences, in order to provide appropriate treatment services. These questionnaires were forwarded to the staff psychologist for review and possible follow-up when deemed necessary.

Information regarding each participant's general health perceptions was obtained from responses to the question, "Overall, would you say your health is: excellent, very good, good, fair, or poor." Participants would choose one of the responses to this query. Their responses to questions regarding medical complaints over the previous 4 weeks

were coded according to the ten categories of types of medical problems: gastrointestinal, neurologic, musculoskeletal, gynecologic, cardiac, depression, anxiety, eating disorders, substance abuse, and obsessive-compulsive disorders.

The operational definition for sexual assault in this research was based on the respondent's affirmative reply to the question, "Has anyone ever used force or the threat of force to have sex with you against your will?" Participants also were asked whether the sexual assault occurred during military service. Child sexual abuse was defined as any affirmative response to the question, "Were you ever sexually assaulted or touched in a sexual way, by a person 5 or more years older than you, when you were younger than 13?" Two independent variables were identified in this study: women who had experienced sexual trauma via sexual assault or child sexual abuse, and a comparison group of women with no self-reported sexual trauma.

Medical records of each participant were accessed through the electronic records system of the VA Medical Center. Beginning with the date of their enrollment in the Women's Clinic and going forward for two years, the total number of visits to primary care and specialty clinics, number of visits to the emergency room or Urgent Care clinic, and the total number of prescription drugs provided to each participant were tabulated. The type and extent of any mental health services was also determined from this medical record to include any visits to psychiatrists for psychotropic medications and/or any sessions of group or individual psychotherapy with mental health professionals.

Measures

The Trauma Questionnaire (TQ) was developed on the national level by the Women Veterans Comprehensive Health Centers' staffs, and validated at the Durham, NC Veteran's Administration Medical Center (McIntyre et al., 1999). The TQ is a

10-item self-report questionnaire that assesses a woman's history of childhood and adult sexual trauma, sexual harassment, and domestic violence, along with measures of desire for mental health services. The Durham researchers compared responses on the TQ to those given during an interview by experienced clinicians using the κ statistic.

Sensitivity and specificity were computed and found to be .89 (sensitivity) and .90 (specificity) for sexual assault items, and .89 (sensitivity) and .97 (specificity) for child sexual abuse items. The Women's Health Questionnaire, in which the TQ is embedded, was developed as a screening tool for sexual trauma and major depressive disorder, and also taps into health perceptions and medical complaints concerning an array of current or recent physical symptoms and medical conditions spanning all major organ systems.

Predictions

The Women's Health Questionnaire and participants' medical records were used to test predictions concerning the relationship between a history of sexual trauma and physical health problems. Based on previous research on this issue, it was predicted that women with a history of sexual trauma would report lower ratings of their perceived health than nontraumatized women. Similarly, women with a sexual trauma history were expected to report a higher number of physical complaints ranging across physiological systems than women without such a history. The medical records were expected to yield evidence of higher healthcare utilization among sexually traumatized participants through their number of visits to primary care, specialty clinics, emergency room, urgent care clinic, and total number of prescriptions.

It was predicted that women veterans who had been sexually traumatized, but who had subsequently received some form of mental health services, would rate their perceived health status as higher than their nontreated, sexually-traumatized peers.

Similarly, this subgroup was predicted to have fewer physical complaints and lower medical care utilization than the sexually traumatized group who had never engaged in mental health treatments. Any type of mental health intervention, whether it consisted of psychotherapy or psychotropic medications, was expected to moderate the ill health effects that usually follow sexual trauma. Social support in the form of marital status was also predicted to lessen the effect of sexual trauma on all three physical health parameters measured in this study: ratings of perceived health status, physical complaints, and utilization of healthcare services.

Data Analysis

Demographic characteristics were analyzed using standard descriptive statistics, and were then compared between the two groups. Due to the known association between advancing age and medical illness, age was entered into the regression models as a separate variable.

A dichotomous independent variable, sexually traumatized or not, was used in this study, based upon respondents' self-reports of having experienced sexual assault or child sexual abuse. Dependent measures were (a) respondents' rating of perceived health, (b) number and type of medical complaints within the past four weeks, (c) number of visits to health care providers over a 2-year period, (d) number of unscheduled visits to the emergency room or urgent care clinic over a 20-year period, (e) and number of prescriptions filled for medical conditions. Comparisons between the two groups were conducted using individual T-tests for each dependent measure.

In addition, two additional variables, marital status and mental health interventions, were examined for their possible moderating effect on the trauma/health relationship. Two types of statistical analyses were conducted in this examination. Both

linear and binary logistic regression analyses were utilized to investigate the potential moderating effect of these variables on the dependent measures.

CHAPTER 4 RESULTS

The sample of 210 participants was split into two groups: no sexual trauma and sexual trauma, based upon their responses to the questions regarding experiences of child sexual abuse and adult sexual assault. Demographic characteristics were compared between the two groups, which differed significantly only on age and race. The trauma group was younger than the no trauma group (mean age 48.4, s.d. 13, vs. 53.8, s.d. 16.9; $t = 2.370$, $p < .01$), and had a slightly higher number of racial minorities (23.9% vs. 16.4%; $t = 1.801$, $p < .04$). The two groups did not differ significantly on marital status or education level. A total of 73 women (34.8%) reported having experienced one or more forms of sexual trauma in their lifetime.

To test the first three hypotheses identified, individual *t*-tests were conducted on the differences between means between the two groups on the measures concerning health perceptions, health complaints, and healthcare utilization. In conducting these analyses, a pattern of different responses was seen between those who had been traumatized in childhood versus those traumatized as adults. Additional *t*-tests were conducted on subgroups of this population: those who had experienced adult sexual assault (ASA), those who had experienced child sexual abuse (CSA), and those who had experienced both forms of trauma (both), compared against the "no trauma" group. Although this last subgroup contained subjects who were also in one of the first two subgroups, their experience of having experienced sexual trauma in both developmental

phases of life was thought to render their responses as qualitatively different than the other two groups, necessitating a separate analysis. None of the three subgroups was compared against the other; all were compared against the "no trauma" group. Child sexual abuse was reported by 54 women (25.7%), adult sexual assault was reported by 44 women (21%), and a total of 25 women (11.9%) reported experiencing both forms of abuse. The final two hypotheses (those relating to potential moderating variables of marital status and mental health interventions) were analyzed through correlation, stepwise linear regression, and binary logistic regression.

Hypothesis 1: Health Perceptions

The measure used to capture participants' self-ratings of their general health consisted of a 5-point scale, ranging from 1 = "excellent" to 5 = "poor." Due to a tendency among participants to select the middle rating (no trauma mean = 2.79, s.d. .99, vs. trauma mean = 2.96, s.d. .96), the ratings were collapsed into a dichotomous variable of positive ratings (excellent, very good, and good = 0) and negative ratings (fair and poor =1) for further analyses. To test the hypothesis that women who have experienced sexual trauma would assign poorer ratings to their perceptions of health than women without such experiences, a between-subjects *t*-test was conducted. While there was a general trend towards poorer ratings by the sexual trauma group, results of an independent samples *t*-test did not support this prediction, $t = -1.229$, $p < .11$. The frequency of poor subjective ratings was observed to be greater in two subgroupings: those who had been sexually assaulted as adults and those who had experienced both adult and child sexual abuse (34% and 36% respectively versus 21% in the nontraumatized sample). Therefore, subgroupings of the sexually traumatized sample were also compared with the nontraumatized group via individual *t*-tests.

Table 4-1. Comparison of means on health perceptions between trauma groups

Group	N	Mean	Std. deviation
No trauma	135	.21	.41
Any sex trauma	72	.29	.46
Adult sex trauma	43	.35	.48
Child sex trauma	54	.28	.45
Both adult/child	25	.36	.49

Analysis revealed that women who had experienced adult sexual trauma were significantly more likely to rate their health as "poor" than were nontraumatized women ($t = -1.780$, $p < .04$). Women who had experienced child sexual abuse, and those who had experienced both adult and child sexual trauma, did not differ significantly from the nontraumatized sample ($t = -.922$, $p < .18$, and $t = -1.569$, $p < .06$ respectively). Therefore, the prediction that women who had experienced sexual trauma would assign poorer ratings to their general health status than nontraumatized women held true only for the subset of this sample who had experienced adult sexual assault.

Hypothesis 2: Health Complaints

Compilation of the total number of health complaints reported by participants in the 4 weeks preceding their completion of the Women's Health Questionnaire served as the dependent measure in testing the hypothesis that women who have experienced sexual trauma would report a greater number of health problems than women without such experiences. This prediction was supported by comparisons of the mean difference between the trauma/no trauma groups, as well as between all subgroups. Since the number of health complaints tended to increase among the trauma groups, all findings are reported at the one-tailed significance level. The first level of comparison made between the "no trauma" and "trauma" groups revealed that traumatized women reported

significantly more health problems in the preceding four weeks ($t = -3.325$, $p < .00$). Subsequent analyses demonstrated that the group who experienced both forms of abuse reported the highest number of health complaints ($t = -3.141$, $p < .001$), followed by the adult sexual assault group ($t = -3.698$, $p < .001$). The child sexual abuse group, while reporting fewer complaints than the other trauma groups, still had a significantly higher number than the "no trauma" group ($t = -2.776$, $p < .003$).

Table 4-2. Comparison of means on health complaints between trauma groups

Group	N	Mean	Std. deviation
No trauma	137	4.81	3.67
Any sex trauma	73	6.74	4.58
Adult sex trauma	44	7.43	5.21
Child sex trauma	54	6.52	4.22
Both adult/child	25	7.48	5.07

The types of health complaints reported by participants spanned nine categories, out of which the trauma group endorsed substantially more complaints than the nontrauma group in six categories. Those included gastrointestinal (54.8% vs. 44.5%), neurologic (60.3% vs. 42.3%), musculoskeletal (78.1% vs. 69.3%), depression (72.6% vs. 60.6%), anxiety (61.6% vs. 49.6%), and obsessive-compulsive (19.2% vs. 5.8%). The research prediction that women who had experienced sexual trauma would report a greater number of health complaints across a variety of systems than nontraumatized women was supported. As reported previously, an analysis of subgroups of the traumatized sample revealed different patterns of responses according to the type of sexual trauma they had experienced, with women who experienced adult sexual abuse reporting the highest level of health problems.

Hypothesis 3: Healthcare Utilization

The dependent variable of healthcare utilization was represented by three different measures assessed over a 2-year period of measurement beginning the date of their enrollment in the Women's Clinic: (a) the number of medical visits to primary care or specialty care providers, (b) the number of unscheduled visits to the emergency room or urgent care clinic, and (c) the number of prescription medicines on record for the individual. Due to a skewed distribution pattern found in the measures of medical visits and emergency room visits, these variables were transformed from continuous measures into categorical measures. Total medical visits were assessed for the entire sample, then classified into one of four categories of approximately equal proportions (0 = 1 to 7 visits, 1 = 8 to 12 visits, 2 = 13 to 25 visits, and 3 = 26 and over visits). Emergency room visits were classified dichotomously (0 = no visits and 1 = any visits).

Two of the three dependent measures: medical visits ($t = -1.835$, $p < .034$) and prescriptions ($t = -2.569$, $p < .006$), were found to be significantly higher for the trauma group compared to the nontrauma group. However, there was no significant difference found between the two groups on utilization of emergency room services ($t = -.529$, $p < .30$). Again, one-tailed levels of significance are reported since the higher reported means on these measures for the groups who had experienced sexual trauma ensures the reliability of predicting direction of change. Table 4-3 summarizes the mean scores and standard deviation scores for these three measures of healthcare utilization across all trauma groups.

The subgroups of adult sexual trauma and child sexual trauma similarly displayed significantly more medical visits and prescriptions when comparing between these two

groups and the "no trauma" group, but no significant difference in the number of emergency room visits. However, an analysis of the subgroup of participants who had experienced both types of abuse did result in significant differences on all three measures of healthcare utilization. Table 4-4 displays the results of these analyses.

Table 4-3. Comparison of means on healthcare utilization between trauma groups

	Group	N	Mean	Std. dev
Medical visits	No trauma	137	1.44	1.16
	Any sex trauma	73	1.74	1.08
	Adult sex trauma	44	1.77	1.08
	Child sex trauma	54	1.83	1.08
	Both adult/child	25	2.00	1.04
ER visits	No trauma	137	.31	.46
	Any sex trauma	73	.34	.48
	Adult sex trauma	44	.39	.49
	Child sex trauma	54	.37	.49
	Both adult/child	25	.48	.48
Prescriptions	No trauma	137	6.80	6.12
	Any sex trauma	73	9.25	7.32
	Adult sex trauma	44	9.64	8.25
	Child sex trauma	54	9.44	6.75
	Both adult/child	25	10.36	7.79

Table 4-4. *t*-test results for healthcare utilization measures between trauma groups

Trauma group	Medical visits		E.R. visits		Prescriptions	
	<i>t</i>	sig. (1-tailed)	<i>t</i>	sig. (1-tailed)	<i>t</i>	sig. (1-tailed)
Any	1.835*	.034	.529	.30	2.569**	.006
Adult	1.692*	.046	.980	.16	2.441**	.008
Child	2.160*	.016	.845	.20	2.607**	.005
Both	2.257*	.013	1.696*	.046	2.555**	.006

* significant at $p < .05$

** significant at $p < .01$

Examination of Moderating Variables

Correlational analyses were performed on five dependent measures and the two moderating variables, marital status and mental health interventions, to examine their relationship to one another and to sexual history and age of participant. Results indicated that marital status was not correlated with any of the dependent variables, and was only weakly correlated with mental health interventions ($r = -.15$, $p < .015$, $N = 209$). Marital status did differ significantly between the trauma subcategories, with the CSA group evidencing the highest rate of marriage (65.5%), followed by the no trauma group (46.3%), and with the ASA and both traumas groups reporting the lowest rates of marriage (36.8% and 36% respectively). One-way analysis of variance between the trauma categories on marital status resulted in $F(2,72) = 3.109$, $p < .05$. Mental health interventions were found to be most strongly correlated with health complaints ($r = .428$, $p < .0001$, $N = 210$), and showed weak to moderate correlations with health perceptions ($r = .219$, $p < .002$, $N = 207$), medical visits ($r = .189$, $p < .006$, $N = 210$), emergency room visits ($r = .20$, $p < .004$, $N = 210$), and prescriptions ($r = .263$, $p < .0001$, $N = 210$). Age was found to have a negative, moderate association with mental health interventions, as well as with reported sexual history. Mental health interventions also showed a moderate correlation with sexual history as indicated on the following page.

Because the distribution of the number of mental health visits over a 2-year period for this sample was found to be skewed, with a high percentage of participants reporting no mental health service utilization, this variable was transformed from a continuous variable to a dichotomous variable (0 = no visits, 1 = any visits). In the overall sample, only 60 subjects (28.5%) had received any form of mental health services. Utilization of mental health services was highest among women who had

Table 4-5. Correlations between moderating variables, dependent variables, and trauma history

		Mental health tx	Marital status	Health perceptions	Health complaints	Medical visits	ER visits	Rx's	Age	Sex history
Mental health tx	r	1.000	-.151*	.219**	.428**	.189**	.200**	.263**	-.258**	.304**
	sig	-.014	.001	.000	.003	.002	.000	.000	.000	.000
Marital status	r	-.151*	1.000	-.035	-.056	.051	-.020	-.073	.082	-.060
	sig	.014	-.309	.211	.234	.389	.146	.118	.195	
Hlth perceptions	r	.219**	-.035	1.000	.406**	.244**	.189**	.190**	-.095	.119*
	sig	.001	.309	-.	.000	.000	.003	.003	.086	.043
Hlth complaints	r	.428**	-.056	.406**	1.000	.320**	.189**	.350**	-.052	.251**
	sig	.000	.211	.000	-.	.000	.003	.000	.226	.000
Medical visits	r	.189**	.051	.244**	.320**	1.000	.365**	.606**	.139**	.142**
	sig	.003	.234	.000	.000	-.	.000	.000	.022	.020
ER visits	r	.200**	-.020	.189**	.189**	.365**	1.000	.321**	-.073	.084
	sig	.002	.389	.003	.003	.000	-.	.000	.145	.112
Rx's	r	.263**	-.073	.190**	.350**	.606**	.321**	1.000	.199**	.184**
	sig	.000	.146	.003	.000	.000	.000	-.	.002	.004
Age	r	-.258**	.082	-.095	-.052	.139*	-.073	.199**	1.000	-.218**
	sig	.000	.118	.086	.226	.022	.145	.002	-.	.001
Sex history	r	.304**	-.060	.119*	.251**	.142*	.084	.184**	-.218**	1.000
	sig	.000	.195	.043	.000	.020	.112	.004	.001	-.

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

experienced both child and adult sexual abuse (64%), followed by those who reported adult abuse (36.8%), child sexual abuse (31%), and no sexual trauma (20.4%).

Stepwise linear regression analysis was used to determine whether marital status, age, and/or mental health interventions moderated the relationships between sexual trauma history and health complaints, medical visits, and prescriptions. Binary logistic regression was used to examine the relationships between marital status, age, and mental health interventions with health perceptions and emergency room visits. The procedure used was the indicator contrasts method, in which the contrasts indicate the presence or absence of category membership. This contrast is equivalent to the traditional "dummy variable" approach. The first category, no sexual trauma history, is the reference category and, as such, is not included in the model estimation. Sexual trauma history was analyzed by partitioning the trauma group into subgroup classifications of adult sexual assault (ASA), child sexual abuse (CSA), and both forms of sexual trauma. No relationship between marital status and the health-related outcomes was observed. Age was found to have significant effects on medical visits and prescriptions. Mental health interventions, although correlated with the health outcome measures, were not found to have any significant moderating effect on any of these variables.

As shown in Table 4-6, the use of mental health interventions accounted for only a small portion of the variance among women's self-ratings of their general health, while none of the other predictors had any significant effect.

As this model demonstrates, both sexual trauma history and mental health utilization have significant effects on the number of health complaints, and the utilization of mental health services appears to be a stronger predictive factor for health complaints than the other proposed variables.

Table 4-6. Logistic regression analysis on health perceptions

Variable	B	S.E.	Wald	Exp(B)
Sex. history			1.1410	
CSA	-.2782	.5028	.3061	.7571
ASA	-.4555	.6508	.4899	.6341
Both	.1837	.6756	.0739	1.2016
Mental health	.9539	.3730	6.5403**	2.5958
Marital status	.0342	.3454	.0098	1.0347
Age	-.0039	.0115	.1166	.9961
Constant	-1.0587	.7611	1.9349	

Chi-square/df: 10.589/6*

Nagelkerke R-square: .075

* significant at p=.051

** significant at p<.01

Table 4-7. Stepwise linear regression predicting health complaints

	Model	B	SE	Beta	R sq.
Step 1	Sex history	.973	.26	.251*	.06
Step 2	Sex history	.51	.25	.133*	.20
	MH tx	3.50	.59	.388**	
Step 3	Sex history	.56	.257	.146*	.21
	MH tx	3.68	.611	.406**	
	Marital	6.096E-02	.519	.007	
	Age	2.210E-02	.017	.085	

* significant at p<.05

** significant at p<.01

Table 4-8. Stepwise linear regression predicting medical visits

	Model	B	SE	Beta	R sq.
Step 1	Sex history	.153	.074	2.074*	.02
Step 2	Sex history	.101	.077	.093	.04
	MH tx	.405	.180	.161*	
Step 3	Sex history	.138	.076	.128*	.09
	MH tx	.548	.182	.217**	
	Marital	.168	.154	.074	
	Age	1.546E-02	.005	.213**	

* significant at p<.05

** significant at p<.01

Although sexual trauma history, mental health interventions, and age were significant for their effects on medical visits, only a small portion of the variance could be accounted for in this model. As shown in Table 4-9, the use of mental health interventions accounted for only a small portion of the variance among women's use of emergency room services, while none of the other predictors had any significant effect. As illustrated in Table 4-10, while sexual trauma history and mental health interventions were significant, age accounted for more of the variance among this sample's use of prescription medicines than did either of the other variables.

Table 4-9. Logistic regression analysis on emergency room visits

Variable	B	S.E.	Wald	Exp(B)
Sex. history			1.5687	
CSA	-.2465	.4722	.2726	.7815
ASA	-.3640	.5686	.4099	.6949
Both	.3661	.4751	.5937	1.4421
Mental health	.8578	.3492	6.0339**	2.3579
Marital status	.0888	.3153	.0793	1.0928
Age	-.0048	.0103	.2214	.9952
Constant	-.8228	.6122	1.8062	

Chi-square/df: 10.509/6*

Nagelkerke R-square: .069

* significant at p=.052

** significant at p<.01

Table 4.10. Stepwise regression predicting number of prescriptions

	Model	B	SE	Beta	R sq.
Step 1	Sex history	1.160	.428	.184**	.034
Step 2	Sex history	.723	.440	.115*	.08
	MH tx	3.356	1.027	.228**	
Step 3	Sex history	1.017	.425	.162**	.17
	MH tx	4.224	1.012	.287**	
	Marital	-.611	.860	-.046	
	Age	.133	.028	.315**	

* significant at p<.05

** significant at p<.01

Post Hoc Analyses

Additional analyses were conducted on a subgroup of this sample who had responded affirmatively when asked if their sexual assault had occurred during their military service. A total of 25 participants indicated they had experienced sexual assault in the military (SAIM), which accounted for 11.9% of the sample. Descriptive statistics for this group reveal that they are younger than the other trauma groups, and significantly younger than the nontraumatized participants (mean age = 44.4 years for SAIM, s.d. 11.7, vs. 53.8 years for nontraumatized, s.d. 16.9). Other differences noted between this subgroup and the women who had denied experiencing any sexual trauma were a higher percentage of minority participants (28% vs. 16.4%), and a greater number were not married or in a committed relationship (68% vs. 54%). Independent sample *t*-tests for mean differences between the SAIM group and the no trauma group on the five dependent variables revealed a significant difference only on the number of health complaints ($t = 4.062$, $p < .0001$). No other physical health variables were found to be significantly different. The presence of mental health interventions differed among these two groups with 48% of the SAIM group using these services versus only 20.4% of the no trauma group ($t = 3.002$, $p < .002$).

CHAPTER 5 DISCUSSION

This study explored the relationship between experiences of sexual trauma and subsequent physical health problems among women veterans receiving their healthcare at a Veterans Affairs Medical Center. The study was designed to test hypotheses about the impact of sexual trauma on women's perceptions of their own health status, the number and type of current health complaints, and their utilization of healthcare services, along with an exploration of potential moderating variables. This research is both a replication and extension of previous investigations into the trauma/health relationship. It serves to confirm earlier findings on the robust association between sexual trauma and health perceptions, physical symptoms, and healthcare utilization, while extending the generalizability of such findings into the population of female military veterans. Additionally, this study has attempted to explore the possible buffering effects of marital status and mental health interventions on the trauma/health relationship. Archival records were utilized for this investigation.

The results of this study may be interpreted as supporting the existence of a relationship between sexual trauma and poorer subsequent physical health, beyond what might be reasonably expected from any actual physical injuries received during the traumatic experience. Support was not found, however, for either of the predictions that marital status or mental health interventions would serve to moderate the effects of sexual trauma on physical health. Although specific types of sexual trauma effects were

not predicted, data analysis revealed a pattern of different effects among those victimized in childhood versus adulthood on measures of health outcomes.

Health Outcome Measures

Health Perceptions

Information regarding each participant's self-rating of her general health was obtained from her response to the question, "Overall, would you say your health is excellent, very good, good, fair, or poor." Participants chose one of the responses to this query, and it was expected that women who had experienced sexual trauma would rate their health as poorer than nontraumatized women. This prediction was not entirely supported by the results. As expected, traumatized women did rate themselves slightly lower on general health but not enough to be statistically significant. Further analysis revealed that most respondents tended to choose the middle response when offered the five-point scale, with the trauma group displaying more variance. To clarify results, the five ratings were then collapsed into two categories, good or poor, and reanalyzed. A higher proportion of the trauma group categorized their health as poor than did the no trauma group, lending support to this hypothesis. When the trauma group was divided into subgroupings corresponding to the type of trauma experienced, further details emerged. The group of women who had experienced adult sexual assault (ASA) rated their health perceptions significantly lower than nontraumatized women. Those who had experienced child sexual abuse (CSA) did not. The group who had experienced both forms of abuse reported lower perceptions of their own health than the CSA group, but higher than the ASA group.

The implications from this finding suggest that the proximity in time of the sexual trauma may have an impact on health perceptions. It is possible that adults who were

sexually abused as children have had sufficient time to process their abuse, both cognitively and emotionally, and the experience does not then influence their self-ratings. A sexual assault during adulthood would be more contemporaneous to this study and may, therefore, have had a bigger impact of the individual's perceptions of their own "wellness." The most surprising finding in this analysis concerned the group who had experienced both forms of abuse. It was expected that they would provide the lowest self-ratings due to the cumulative effect of trauma, yet this was not so. These results might, however, have been the result of low power due to a small sample size (N = 25).

Health Complaints

It was predicted that women who had experienced sexual trauma would report a higher number of health complaints over a wide variety of body systems than women without sexual trauma. This was measured through their responses to the Women's Health Questionnaire on which they were asked to identify which, if any, of 24 possible health problems they had experienced in the past four weeks. Results were supportive of this hypothesis, with all categories of trauma victims reporting significantly more health problems than nontraumatized respondents. The 24 health problems were then collapsed into nine different categories corresponding to major health systems: gastrointestinal, neurologic, musculoskeletal, gynecologic, cardiac, depression, anxiety, substance abuse, and obsessive-compulsive disorder. Subjects who reported a history of sexual trauma endorsed a significantly higher number of symptoms in six of these nine categories: gastrointestinal, neurologic, musculoskeletal, depression, anxiety, and obsessive-compulsive disorder. Surprisingly, there was no difference in the number of gynecologic symptoms reported between the trauma/no trauma groups. This finding was contrary to prior research by Golding (1996), who found a strong correlation between gynecologic

problems and sexual assault. This finding may be due to the fact that there were only two questions focusing on this problem area, rendering it less than optimally assessed.

A small difference in the number of complaints was evident across trauma subcategories, however this difference was statistically insignificant. Victims of both types of abuse reported the highest number of problems, followed by the adult sexual assault group, then the child sexual abuse group. This result is suggestive of the harmful effects of compounded trauma experiences on health outcomes, and that the proximity in time of the sexual trauma may have an impact on health complaints. Survivors of adult sexual assault may still be suffering from actual injuries received during the assault, or may still perceive themselves as "wounded" due to unresolved emotional problems related to the assault.

Healthcare Utilization

Medical records were accessed for all participants in order to measure their level of utilization of healthcare services in three categories: medical visits, emergency visits, and prescription drugs. Beginning with the date of enrollment in the Women's Clinic, each record was examined for the total number of visits to primary care, specialty clinics, urgent care, and the emergency room over a 2-year period. The total number of prescription medicines on record for each participant was also captured. It was predicted that women with histories of sexual trauma would demonstrate an increased utilization of these services over women without such histories. Findings supported this hypothesis in two of the three categories: medical visits and prescription drugs. Usage of the emergency room did not differ between the trauma/no trauma groups. However, an analysis of the subgroup of trauma victims who had experienced both child and adult abuse did reveal a significantly higher pattern of emergency room visits over the "no

trauma" group, again attesting to the severity of health effects in those who have suffered multiple abuse experiences. These findings are consistent with prior research which found that women who have been sexually assaulted or sexually abused in childhood have higher numbers of medical visits and higher healthcare costs (Farley & Patsalides, 2001; Finestone et al., 2000; Golding et al., 1988; Walker et al., 1999).

Moderating Effects of Marital Status and Mental Health Treatment

Marital Status

The idea that women who were currently involved in marriage or a committed relationship would suffer less ill-health effects from their trauma stemmed from the literature on the benefits of social support for coping with the aftermath of trauma (Kimerling & Calhoun, 1994; Ullman, 1999) and on the positive relationship between marriage and better health (Declerck et al., 2002; Hughes & Waite, 2002; Hunt et al., 2002). Findings from this study did not support this prediction. Participants were assigned to one of two categories, married/committed or not, based upon their responses to demographic questions involving their current status. Although interesting differences emerged between the trauma categories and the no trauma group (those who had experienced child sexual abuse were more likely to be in a relationship than those in the other categories), no significant effect was found for marital status on the measured health outcomes. Marital status itself may not be a good indicator of social support in that it only determines the existence of a relationship and not the quality of it. Social support literature stresses that it is the acceptance, understanding, and availability implicit in good relationships that eases the trauma burden (Kimerling et al., 1994). It is also possible that this form of trauma is more likely to disrupt intimate relationships due to its sexual nature. Partners of victims may have a difficult time reconciling their own

anger, distrust, and/or jealousy after such an experience, negating the stress-reducing effects of the relationship. Thirdly, it is possible that some of the sexual abuse being measured in this study could have been perpetrated by the marital partners themselves. Future research in this area should focus more on the quality of the relationship and the partners' roles in the aftermath of trauma.

Mental Health Interventions

This study attempted to explore the possibility that mental health treatment would moderate the effects of sexual trauma on physical health. Little research on this question was found in the existing literature, although logical reasoning suggested that addressing emotional problems posttrauma should lessen some of its ill-health effects. Medical records for each participant were evaluated for utilization of any mental health services within the 2-year period following their completion of the Women's Health Questionnaire. Mental health services included appointments with psychiatrists, psychologists, or any other licensed mental health service provider encompassing psychotropic medication management, group therapy, and individual therapy. Results of a comparison between sexual trauma history, mental health service utilization, and health outcomes did not support this prediction. While mental health was significantly related to physical health, it did not play a moderating role in the sexual trauma/health relationship. What did emerge from this analysis was evidence that women who had experienced both forms of sexual trauma utilized mental health services at a much higher rate than those in the other trauma categories, 5.9 times the rate of the no trauma group and about three times the rate of the CSA and ASA groups. While causality cannot be assessed from this study, these findings underscore the severity of harmful effects, both mental and physical, that may be related to repeated sexual trauma throughout the

lifespan. While utilization of mental health services was not found to have a moderating effect in this study, it does not negate the possibility of such a relationship. The measure used in this study was necessarily broad and may have poorly targeted the desired variable. Certainly there are vast qualitative differences between a brief psychiatric appointment meant to monitor medication and psychotherapy focusing on an individual's emotional needs. The continuity of treatment and number of visits would likely effect the outcome of treatment, but were not captured in this study. The dichotomous nature of this variable, having received any treatment or not, did not allow for these distinctions. Similarly, in this study, the focus of treatment was not determined, meaning that the topic of sexual trauma was not necessarily ever addressed in any of these treatment sessions. It should be expected that, if mental health services are to reduce the ill-health effects of trauma, the cognitive and emotional processing of the trauma would need to be part of the treatment. Additionally, due to research design, the temporal relationship between the trauma and subsequent mental health treatment and the reason for seeking treatment were not accessed. Future investigations into mental health treatment as a moderator on the trauma/health relationship should differentiate between types of treatment, duration and focus of treatment, and when treatment occurs in relation to the trauma.

Limitations of the Study

As with any study that is not a true experimental design, attributions of causality cannot be made. While there appears to be a relationship between sexual trauma history and physical health, it is not possible to conclude that the experience of sexual victimization directly caused diminished health outcomes. As referenced earlier, there were several aspects of the research design that limited interpretation of the results.

Because participants could not be assigned to groups, but rather were categorized according to their self-report of trauma, several threats to internal validity were introduced. Women may have been influenced by social desirability when completing the trauma questionnaires and therefore reluctant to disclose sexual victimization. Previous work by Widom and Morris (1997) revealed that there is substantial underreporting by sexually abused women, and the recall rates varied from 41% to 67%. Other reasons for underreporting may be related to embarrassment, repression, or simple memory decay. The time between the incident and the survey questionnaire may influence accuracy of reporting, with longer periods related to more underreporting, as does the relationship between the victim and perpetrator influence recall (Turner, 1972).

Another aspect of sampling bias that needs to be considered is the how the variables deciding group categories were defined. In the field of sexual trauma research, there is a wide variety of operational definitions given to the terms "child sexual abuse" and "sexual assault." Definitions vary across age of victimization, age difference between victim and perpetrator, type of sexual act, and degree of coercion or force used. This lack of a central definition makes comparisons across studies difficult.

The setting of this study in a V.A. medical center introduces its own sampling bias. Women who participated had self-selected for some reason to receive all or part of their medical care through this government entity. The proportion of their care received through the V.A., and their reasons for choosing this healthcare service (economic, geographic, or personal preference), were unknown to the researchers and could have influenced the outcome of this study. This bias is especially important to note when addressing the issue of sexual assault in the military (SAIM), as it is likely that some women who were victimized during their military service choose to avoid using V.A.

services due to the setting serving as a reminder of their trauma. Additionally, any physical or mental health treatment received outside the V.A. could not be accessed in the available records and, therefore, was not factored into this analysis.

Another limitation to the study is the lack of information about participants' lives regarding other possible traumatic stressors they may have experienced, such as recent death of a spouse, interpersonal violence, major accidents, or natural disasters. Effects of trauma are known to be cumulative and knowledge of past events would enhance the validity of group comparisons.

The temporal relationship between the sexual trauma and the survey questionnaire was not assessed. As mentioned above, underreporting of sexual abuse is strongly related to the elapse of time since the incident. Additionally, having information about when the trauma occurred would also strengthen validity by controlling for maturation effects, allowing for comparisons between groups that factor in developmental stages.

Other limitations to this study include the lack of control over the circumstances surrounding the collection of the survey data. Because this was archival research, examining data gathered via medical screenings, the possibility of differential treatment among participants exists. Women were asked to complete the survey upon enrollment in the primary care clinic, and differences may exist in the amount of time and privacy afforded them in completing the questionnaire. Their current health concerns, prompting them to seek medical treatment, may have influenced their perceptions of their own health ratings and their compilation of recent symptoms.

Additionally, as reported earlier, the measures used in this study to examine possible moderating variables did not address the issue of quality. In considering marital

status and mental health treatment, it would be much more useful to understand the nature of the relationship/treatment than to simply know that it exists. Caution must be used in interpreting the correlation between mental health treatment and health complaints in this study, as the measure used to quantify physical symptoms contained items that overlap between the domains of physical and mental health.

Lastly, these results cannot be generalized to populations differing from the women participating in this study, who represent middle-aged military veterans who choose to receive their healthcare through the V.A. system. Previous research suggests that this population has a higher incidence of reported sexual trauma and lower ratings of perceived health status than the general population.

Recommendations for Future Research

Because of the limitations and problems referenced earlier in this work, future research in this area should attempt to employ a prospective design rather than a retrospective one. Although inherently difficult to accomplish, such a design eliminates many of the threats to validity. Longitudinal studies, with groups of trauma victims identified from verifiable records matched against similar nontrauma groups, would create a powerful design for studying health effects. Carefully examining the operational definitions of categories of abuse and comparing only between studies with similar, explicit definitions would also enhance the significance of findings.

Future studies examining the role of marital status in association with trauma and health would benefit from careful analysis of the quality of the relationship and the degree of support perceived from it. When inquiring about the status of a "committed relationship," it should be made explicitly clear that this includes same-sex relationships as well as heterosexual relationships. Similarly, mental health services need to be

considered by the type of service rendered, as well as the duration and focus of treatment. The participant's perception of the quality and usefulness of such treatment would also be valuable information.

Measures asking for participants' perceptions of their own general health status would be more powerful if a 4- or 6-point Likert scale were used, instead of a 5-point, eliminating the possibility of choosing a neutral response. The measure accessed in this study classified the health status of "good" as the third scale point, rendering it a neutral response. It is this researcher's opinion that "good" health has a positive valence rather than neutral, and future instrument design should be constructed accordingly.

Finally, multiple methods of assessing the variables are recommended, utilizing structured interviews, self-reports, and existing records. Implementation of these recommendations would go a long way towards increasing the power, scope, validity, and generalizability of future research in this area.

Conclusion

Subject to the limitations discussed previously, this study is consistent with the existence of a moderate relationship between a history of sexual trauma and various deleterious health-related outcomes. At a minimum, it replicates and extends previous research demonstrating the increase in health complaints and healthcare utilization among sexually victimized women. While much research remains to be done to clarify the nature of these relationships, the basic tenets of trauma theory—that highly stressful events negatively effect both mind and body—continue to be supported by empirical studies, including the present one.

Within the healthcare field, the study of sexual trauma and its subsequent effect on physical health has many potential benefits. By alerting healthcare providers to the

nature of this association, they may be aided in diagnostic clarification and guided in appropriate treatment planning. This would improve healthcare for the patients, and potentially reduce the demand on medical providers for appointments based on vague, psychosomatic complaints. Policies establishing appropriate allocation of finite resources could be made at the agency level, increasing organizational efficiency and reducing unnecessary costs. Additional economic benefits would ensue for the general public through reduced healthcare costs and fewer lost work-days in society's work force.

Finally, an understanding of the trauma/health association could inform the process of psychotherapy. Post-trauma therapeutic work aimed at correcting cognitive distortions and restoring emotional balance would be enhanced by incorporating acknowledgment of physical health problems into the framework. This process would assist in moving providers away from the false dichotomy of mind/body dualism, and closer to the understanding of physical and mental health as contextual and interrelated. Hopefully, the efforts of all healthcare providers will continue to be informed and enhanced by ongoing research into health outcomes related to sexual violence.

APPENDIX
WOMEN'S HEALTH QUESTIONNAIRE

INSTRUCTIONS: This questionnaire is an important part of providing you with the best health care possible. Your answers will help in understanding problems that you may have. Please answer every question to the best of your ability. It will take approximately 10-15 minutes.

Name: _____ Today's Date: _____

SSN: _____ DOB: _____ Are you a veteran? Yes _____ No _____

Marital	Ethnicity	Education
____ Married Now	____ Caucasian	____ 8 th Grade or Less
____ Widowed	____ African-American	____ Some High School
____ Separated	____ Native American	____ High School/GED
____ Divorced	____ Asian-American	____ Trade or Tech School
____ Never Married	____ Hispanic	____ 1-3 Years College
____ Committed Relationship	____ Other	____ Completed College

During the last 4 weeks, have you been bothered A LOT by any of the following problems?
YES NO

1. Stomach Pain
2. Back Pain
3. Pain in your arms, legs, or joints (knees, hips, etc.)
4. Menstrual pain or problems
5. Pain or problems during sexual intercourse
6. Headaches
7. Chest pain
8. Dizziness
9. Fainting spells
10. Feeling your heart pound or race
11. Shortness of breath
12. Constipation, loose bowels, or diarrhea
13. Nausea, gas or indigestion
14. Feeling tired or having little energy
15. Trouble falling or staying asleep, or sleeping too much
16. Often feel you can't control what or how much you eat
17. Little interest or pleasure in doing things
18. Feeling down, depressed, or hopeless
19. Feeling nervous, anxious, on edge, or worrying about a lot of different things
20. Had an anxiety attack (suddenly feeling fear or panic)

During the last 4 weeks: YES NO N/A

21. Have you (or someone you know) thought you should cut down on your drinking of alcohol? _____
22. Was there a single day in which you had five or more drinks of beer, wine, or liquor? _____
23. Do you have ideas, images or impulses that seem silly, weird, nasty or horrible & that keep coming back to you? _____
24. Are there things that you do over and over or thoughts you must think repeatedly in order to get comfortable? _____
25. Overall, would you say your health is:
Excellent _____ Very Good _____ Good _____ Fair _____ Poor _____

PART II

Some women experience traumatic events during their life or in military service. We are trying to find out about these events and how they affect women's lives. We also want to find out if women want mental health help addressing these or other concerns.

	YES	NO
1. Have you ever been involved in a major accident or disaster?	_____	_____
2. Have you ever been physically assaulted or been a victim of a violent crime?	_____	_____
3. At any time, has a spouse or partner (significant other) ever threatened to physically hurt you in any way?	_____	_____
4. At any time, has a spouse or partner (significant other) ever hit you, kicked you, or physically hurt you in any way?	_____	_____
5. Have you ever received uninvited and unwanted sexual attention (e.g., touching or cornering, pressure for sexual favors, remarks)? Did this happen to you while you were in the military?	_____	_____
6. Has anyone ever used force or the threat of force to have sex with you against your will? Did this happen to you while you were in the military?	_____	_____
7. Were you ever sexually assaulted or touched in a sexual way, by a person 5 or more years older than you, when younger than 13?	_____	_____
8. Would you like to talk to a mental health worker about any of the above problems?	_____	_____
9. Do you have any mental health questions or concerns that are not on this questionnaire?	_____	_____
10. Would you like to talk to a mental health worker about these other problems?	_____	_____

Thank you for your time. Please give the completed questionnaire to your nurse or health care provider.

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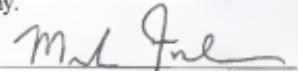
BIOGRAPHICAL SKETCH

Linda R. Feldthausen was born in Elkhart, Indiana, in 1953. She moved frequently during her childhood, living in Indiana, Michigan, Iowa, Mississippi, Arkansas, Arizona, California, and Alaska. She completed her high school education in Kodiak, Alaska, then went on to a career in law enforcement in Anchorage, Alaska.

Linda attended night classes at the University of Alaska and Alaska Pacific University while raising a family and working full-time, completing a bachelor of arts degree in organizational management in 1991. Following her husband's retirement, her family moved aboard a sailboat and cruised the East Coast and Bahama Islands for one year, home-schooling her two daughters in the process. After returning to land, she entered the doctoral program in Counseling Psychology at the University of Florida and completed a Master of Science in Counseling Psychology in 2000.

Linda lives with her husband, Karl Feldthausen, and daughter, Kristen Feldthausen, in Gainesville, Florida. Her oldest daughter, Kelly Feldthausen, is currently serving in the U.S. Air Force. Following graduation, Linda plans to pursue a career in clinical health psychology with the Veteran's Affairs Medical Center and the University of Florida Medical Center in Gainesville, Florida.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



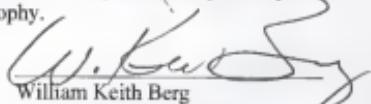
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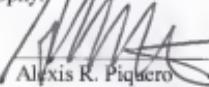
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This dissertation was submitted to the Graduate Faculty of the Department of Psychology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May 2003

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